

We claim:

1. A polyolefin blend comprising a propylene containing polymer,

an ethylene copolymer elastomer, which is a reaction product of a copolymer of ethylene and at least one alpha-olefin, this elastomer functionalized with maleic anhydride,

wherein the alpha-olefin is selected from 1- octene, 1-hexene, 1- heptene, 1- butene, 4 - methyl-1-pentene, and mixtures thereof, and

an ethylene-based polyolefin-metal salt which is the product of an ethylene acid copolymer and a metal salt, the polyolefin-metal salt being an ionomer, an alpha, beta ethylenically unsaturated carboxylic acid polymer in which the acid units are neutralized with metal ion (s).

2. The polyolefin blend of claim 1, wherein the propylene polymer may be at least one of a homopolymer propylene or a random or block copolymer of propylene and ethylene, and the polyolefin blend may be from about 10 to 80 weight percent of the propylene polymer, from about 1 to 50 weight percent of the ethylene copolymer, and from about 5 to 60 weight percent of the polyolefin-metal salt.

3. The polyolefin blend of claim 1, wherein the propylene polymer, for optimal hardness and scratch resistance, consists essentially of from 40 to 75 weight percent of the propylene polymer; from about 1 to 25 weight percent of the ethylene copolymer; and from 5 to 35 weight percent of the polyolefin-metal salt of the blend.

4. The polyolefin blend of claim 1, wherein the ethylene copolymer is crosslinked with peroxide or silane with a catalyst selected from the transition metals of Group VIII, including complexes of these metals, this material optionally crosslinked prior to compounding or in situ.

5. The polyolefin blend of claim 1, wherein the ethylene copolymer is a crosslinked/partially vulcanized thermoplastic elastomer.
6. The polyolefin blend of claim 1, wherein the propylene polymer is selected from at least one of a homopolymer propylene, a random or block copolymer of propylene, and ethylene, and the polyolefin blend may be from about 5 to 75 weight percent of the propylene polymer, from about 1 to 50 weight percent of the ethylene copolymer, and from about 5 to 65 weight percent of the polyolefin-metal salt.
7. The polyolefin blend of claim 1, which includes an interfacial impact modifier selected from a styrene-ethylene interpolymer, styrenic block copolymer or elastomer, and a random styrenic copolymer or elastomer, all of which may have been modified with maleic anhydride.
8. The polyolefin blend of claim 1, wherein the styrenic copolymers, interpolymers or elastomers modified with maleic anhydride represent between 1 to about 30 weight percent of the blend.
9. The polyolefin blend of claim 1, further comprising an ethylene vinyl acetate (EVA) with a vinyl acetate level between 5 to 80 weight percent with maleic anhydride or hydroxy ethyl acrylate.
10. The polyolefin blend of claim 1, wherein the functionalized ethylene vinyl acetate represents between 1 to 30 weight percent of the blend.
11. The polyolefin blend of claim 1, further comprising one or more of terpolymers or copolymers of ethylene, butyl acrylate, and glycidyl methacrylate (GMA); terpolymers of ethylene, ethyl, methyl or butyl acrylate, and maleic anhydride (MAH); terpolymers of ethylene, acrylic ester and maleic anhydride.

12. The polyolefin blend of claim 1, wherein the MAH (unsaturated anhydride) and acrylate (GMA) may be physically crosslinked prior to addition to blend or in situ.
13. The polyolefin blend of claim 1, wherein the modified acrylate copolymers or terpolymers may react with the free acid of the ionomer component.
14. The polyolefin blend of claim 1, wherein the modified acrylate copolymer or terpolymers represent between 1 to 30 weight percent.
15. The polyolefin blend of claim 1, wherein the polyolefin-metal salt is a copolymer or terpolymer ionomer, which is partially neutralized with a metal salt from 5 to 95 %.
16. The polyolefin blend of claim 1, wherein the terpolymer ionomer is modified with methyl, butyl, or ethyl acrylate; wherein the acrylate content from 1 to 25 weight percent.
17. The polyolefin blend of claim 16, wherein the acrylate content represents between 10 and 25 weight percent.
18. The polyolefin blend of claim 1, wherein the metal ion is selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, barium, lead, tin, zinc, aluminum, cadmium, and mixtures thereof.
19. the polyolefin blend of claim 1, wherein the ethylene copolymer may include a low molecular weight ionomer wax or functionalized monomer representing from about 1 to 20 weight percent.
20. The polyolefin blend of claim 1, further comprising a filler from about 1 to 40 weight percent.
21. The polyolefin blend of claim 1, wherein the mineral filler is selected from talc, calcium carbonate, wollastonite, calcium sulfate, barium sulfate, metal fibers,

nanocomposites, ceramic fibers and powders, polymeric fibers, crosslinked polymers, mica, silica, carbon fibers, metal fibers, clay, glass fibers, glass spheres, conductive fillers such as polyaniline, and sulfonated materials such as AMPS.

22. The polyolefin blend of claim 1, further comprising a surface and mold release agent such as high molecular weight silicone and silicone masterbatches, fatty acids (i.e. oleyl palmitamide, erucamide and behanamide) representing from about 0.1 to 10 weight percent.

23. A process for preparing an article from a polyolefin blend consisting essentially of:

providing a propylene polymer containing polymer,

adding a compound which may act as an impact modifier or interfacial agent selected from at least one of: ionomer waxes or functionalized monomers; impact modifiers and functionalized modifiers; a styrenic copolymer or elastomer with maleic anhydride grafting; ethylene vinyl acetate modified with maleic anhydride or hydroxyl ethyl acrylate; terpolymers or copolymers selected from one or more of ethylene, butyl acrylate, and glycidyl methacrylate; terpolymers of ethylene, ethyl, methyl or butyl acrylate, and maleic anhydride; ethylene-propylene rubber with maleic anhydride grafting, the ionomer portion may be a copolymer or terpolymer modified with acrylate;

adding an ethylene based polyolefin-metal salt that is a reaction product of an ethylene containing polymer and a second organic monomer containing a hydrophilic moiety; such component being at least partially neutralized with a metal salt between 5 to 95 %;

mixing the ethylene copolymer until partially or completely crosslinked and adding to the blend; or

crosslinking in situ while adding the propylene polymer and polyolefin-metal salt; or

mixing the propylene polymer, ethylene copolymer, and polyolefin-metal salt; and

injection molding, blow molding or extruding the blend into an article which will display high scratch resistance, low blushing upon impact, low temperature requirements when mandated, tape adhesion, molded in color, controlled gloss levels, superior weatherability, and sonic welding capabilities.